Atmospheric conditions during Smithsonian Observations December 1936

Date	Time from apparent noon	Temperature °C.	Wind, Beaufort	Visibility	Sky blueness	Cloudiness and remarks
Dec. 1	3:36 a. m.	−13.1	NNW 3	6	6	Few Cu; moderate to dense haze; instrument indoors.
5	3:19 a. m.	−2.8	NW 4	7	9	Zero clouds; moderate haze; instrument indoors.
5	0:08 p. m.	+.7	NW 5	8	8	1 Ci; light haze; Frcu near sun.
8	3:26 a. m.	−11.3	NE 3	6	9	Trace Acu; dense haze.
14	1:15 p. m.	+1.3	SW 2	7	9	2 Ci; moderate haze; instrument outdoors.
15	1:52 a. m.	+4.1	W 4	6	8	Zero clouds; dense haze.
18	2:10 a. m.	−6.8	NW 5	9	10	Zero clouds.
22	0:53 a. m.	−5.6	NW 6	9	11	Trace Cu.
22	0:26 a. m.	−6.1	NW 5	9	11	Trace Cu and Frcu.
23	0:56 a. m.	−6.9	WNW 3	8	10	Trace Ci.
24	2:09 a. m.	+1.4	SW 4	5	8	2 Ci; dense haze.
28	1:20 a. m.	+8.3	WNW 6	8	10	Trace Cist; trace Cu; moderate haze.
28	0:35 a. m.	+8.3	WNW 6	8	10	Trace Cist; Trace Cu; moderate haze.
29	0:37 a. m.	+2.8	ENE 3	8	9	4 Ci, moderate haze to NE.

POSITIONS AND AREAS OF SUN SPOTS

Note.—The reports for November and December 1936, not having been received in time, will be included in the January 1937 issue of the REVIEW.—*Ed.*

PROVISIONAL SUN-SPOT RELATIVE NUMBERS, DECEMBER 1936

[Dependent alone on observations at Zurich and its station at Arosa]

[Furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

December 1936	Relative numbers	December 1936	Relative numbers	December 1936	Relative numbers
1	*bdd* 193	11	*d* 82	21	*dd* 86
2	*b* ---	12	*Wc* 76	22	117
3	*a* ---	13	*d* 74	23	130
4	---	14	71	24	*Eaccd* 149
5	158	15	40	25	151
6	*Ec* 146	16	43	26	*a* 150
7	*aa* ---	17	*Wac* 70	27	*a* 151
8	*Ec* 134	18	*d* 88	28	*ad* 135
9	104	19	*a* 85	29	*Eacd* 167
10	*a* 107	20	74	30	*Eac* 200
				31	181

Mean, 27 days = 117.5.

a = Passage of an average-sized group through the central meridian.
b = Passage of a large group or spot through the central meridian.
c = New formation of a group developing into a middle-sized or large center of activity: E on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d = Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By L. P. HARRISON

Mean free-air temperatures and relative humidities for December, as determined from airplane weather observations, are given in table 1. The "departures from normal" given in the table are based on "normals" derived from the number of observations indicated in the note at the foot of the table, where the numbers of years over which the observations were taken are given by the figures in parentheses. In general, the numbers of observations available for computing "normals" for the higher levels are less than those available for the lowest levels (represented by the data given in the footnote). To compensate for this discrepancy, the "normals" are obtained by applying the mean differences between the successive standard levels to the data for the lower levels, where the "normal" for the surface based on the indicated number of observations serves as the reference basis. The "normals" in each case include the data for the current month. It will be noted that many of the "normals" are based on only three years of observations. "Departures from normal" in such cases must be regarded as having little weight in comparison with departures from "normals" based on much more extended periods of record (35 or more years, say, which are not uncommon in climatology).

The mean temperatures for the month at the surface (see chart I) were above normal over practically the entire country. The greatest positive departures from normal temperature at the surface were to be found largely in the central part of the country, the southern portion of the Great Lakes area, the coastal strip extending approximately from Massachusetts to New Jersey, and also a small region from eastern Washington to western Montana. Departures in these areas generally were from +1.5° to nearly +3.5° C. Small regions of negative departure from normal were to be found in parts of northern and central California as well as eastern Montana.

The mean temperatures for the month in the free air (see table 1) were largely above normal in the eastern third, and in a portion of the central part, of the country. The greatest positive departures from normal temperature in the free air were largely concentrated in the area encompassed by the stations at Boston, Lakehurst, Mitchel Field, Scott Field, and Wright Field, where the departures for these respective places ranged as follows in the free-air levels for which data were available: +3.4° to 4.6° C., 2.6° to 5.5° C., 4.4° to 6.9° C., 1.4° to 3.8° C., and 2.7° to 4.7° C.

Negative departures from normal free-air temperatures during December were generally small in magnitude and were mostly confined to the western third of the country with extensions in the north-central and south-central areas. The negative departures were most pronounced at Spokane and San Diego (−0.8° to −3.5° C., and −1.1° to −2.3° C., respectively).

Mean monthly free-air relative humidities during the month under review were appreciably below normal in the eastern third of the country at all levels except those within 0.5 to 2 km of the ground in some cases, where above-normal humidities prevailed in a slight degree. The region of most marked negative departure from normal relative humidity could be identified with the region of greatest positive departures from normal of temperature referred to above. This condition was most pronounced in the levels from about 1.5 to 4 km above sea level, where departures as great as −16 to −18 percent occurred at Lakehurst, Mitchel Field, and Wright Field. (It is possible that these values are somewhat greater than they should be, owing to the lack of a full month's observations—19, 18, and 20 observations, respectively, being actually available—and the absence of data principally for days with low clouds, precipitation, etc.) The layer of marked subnormal humidities occurred at somewhat lower elevations in the southwestern portion of